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NO_y LIFETIMES AND O_3 PRODUCTION EFFICIENCIES IN URBAN AND POWER PLANT PLUMES: ANALYSIS OF FIELD DATA

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Ozone production efficiency with respect to NO_x, (OPEx), is a central quantity in emission control strategies since it is a measure of how many O_3 molecules are produced by each NO_x before it is lost from the catalytic cycle producing O_3. OPEx has custmarily been estimated from the relationship between O_3 and NO_z (where NO_z is defined as the concentration of NO_x oxidation products). This procedure implicitly assumes that NO_y is a conserved quantity and that the measured NO_z concentrations are an adequate surrogate for the quantity of NO_x that has been consumed. Although it has been recognized that the OPEx derived in this way may be over-estimated, the effect has for the most part been neglected. Here we examine several ways of estimating the NO_z loss rate and determining the true OPEx, and compare the OPEx of the Nashville urban plume, to the OPEx in plumes from several power plants in the Nashville area.

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